

In the Claims:

1. (currently amended) An implantable hearing device comprising: a vibrational assembly enclosed in a hermetic housing,

wherein said hermetic housing comprises a sealed end, wherein said sealed end comprises a wall; and

wherein said vibrational assembly is configured to vibrate said hermetic housing and wherein said vibrational assembly comprises:

a) at least one controllable vibrating element, wherein said controllable vibrating element comprises:

i) a plurality of piezoelectric elements arranged in a stack, wherein said piezoelectric elements are configured to alternately expand and contract when a voltage is applied to said piezoelectric elements; and

ii) a plurality of electrically conductive bonding layers which are located between said piezoelectric elements in said stack, wherein said electrically conductive bonding layers serve to connect said piezoelectric elements mechanically and electrically in said stack; ~~and~~

b) a plurality of wires, wherein at least one of said wires is attached to each of said electrically conductive bonding layers; and

b~~c~~) an inertial mass configured to vibrate in response to vibration of said controllable vibrating element.

2. (previously presented) The hearing device of claim 1 further comprising:

at least one microphone;

at least one hermetic housing containing control electronics or a battery; and

a coil for receiving or sending data or power transcutaneously.

3. (cancelled)

4. (original) The hearing device of claim 2 further comprising at least one electrode array.

5. (cancelled)

6. (cancelled)

7. (previously presented) The hearing device according to claim 1 wherein said plurality of piezoelectric elements are substantially disk-shaped, and are stacked with alternating polarities.

8. (previously presented) The hearing device according to claim 1 wherein said electrically conductive bonding layers extend beyond the outer circumference of said piezoelectric elements, thereby providing a contact pad for the attachment of wires, which serve to electrically connect said elements.

9. (currently amended) The hearing device according to claim 1 wherein ~~a pair~~ at least two of said electrically conductive bonding layers are joined by an electrically conductive link, wherein said pair of electrically conductive bonding layers are formed from an etched metal clip that has been bent.

10-16. (cancelled)

17. (previously presented) The hearing device according to claim 1 wherein said inertial mass is comprised of gold, platinum, iridium, lead, rhenium, or alloys thereof.

18. (previously presented) The hearing device of claim 1, said hermetic housing further comprises a top that is flexible.

19. (previously presented) The hearing device of claim 18 wherein said stack of piezoelectric elements are connected to said flexible top.

20. (cancelled)

21. (original) The hearing device of claim 18, wherein said flexible top is composed of

titanium, is about 10 to 100 microns thick, and has one or more ridges, in the form of concentric rings, which are impressed into said flexible top to increase flexibility.

22-26. (cancelled)

27. (previously presented) The hearing device of claim 1 wherein said hermetic housing further comprises a base end, wherein a plurality of electrically insulated lead-throughs are disposed through said base end of said hermetic housing.

28. (previously presented) The hearing device of claim 1 wherein said hermetic housing is comprised of titanium, or alloys thereof.

29. (previously presented) The hearing device of claim 1 wherein said hermetic housing is substantially cylindrical in shape.

30. (previously presented) The hearing device of claim 1 wherein said one or more grooves are formed in said wall of said hermetic housing, wherein said grooves are configured to help said hermetic housing osseointegrate into bone.

31. (previously presented) The hearing device of claim 1 wherein said hermetic housing is at least partially coated with a substantially compliant material.

32. (original) The hearing device of claim 31 wherein said compliant material is silicone.

33-42. (cancelled).

43. (previously presented) The hearing device of claim 1, wherein there are between 10 and 100 of said piezoelectric elements in said stack.

44. (cancelled)

45. (currently amended) An implantable hearing device comprising: a vibrational assembly enclosed in a hermetic housing,

wherein said hermetic housing comprises a sealed end, wherein said sealed end comprises a wall; and

wherein said vibrational assembly is configured to vibrate said hermetic housing and wherein said vibrational assembly comprises:

a) at least one controllable vibrating element, wherein said controllable vibrating element comprises:

i) a plurality of piezoelectric elements arranged in a stack, wherein said piezoelectric elements are configured to alternately expand and contract when a voltage is applied to said piezoelectric elements; and

ii) a plurality of electrically conductive bonding layers which are located between said piezoelectric elements in said stack, wherein said electrically conductive bonding layers serve to connect said piezoelectric elements mechanically and electrically in said stack;

b) an inertial mass configured to vibrate in response to vibration of said controllable vibrating element;

The hearing device of claim 1, further comprising

c) a base ring,

d) a non-conductive insert and

e) an interface element,

wherein said base ring is attached to said wall of said hermetic housing, wherein said non-conductive insert is attached to said base ring, and wherein said interface element is attached to at least one of said electrically conductive bonding layers and said non-conductive insert.

46. (currently amended) The hearing device of Claim 45. An implantable hearing device comprising: a vibrational assembly enclosed in a hermetic housing,

wherein said hermetic housing comprises a sealed end, wherein said sealed end comprises a wall, wherein one or more grooves are formed in said wall, and wherein said grooves are configured to help said hermetic housing osseointegrate into bone; and

wherein said vibrational assembly is configured to vibrate said hermetic housing.

47. (previously presented) The hearing device of claim 46, wherein said grooves penetrate to about half or less of the thickness of said wall.

48. (previously presented) The hearing device of claim 46, wherein said grooves have a width of about 0.05 to 0.2 mm.

49. (previously presented) The hearing device of claim 46, wherein said grooves have a depth of about 0.05 to 0.2 mm.

50. (previously presented) The hearing device of claim 46, wherein said grooves are radially disposed in said wall.

51. (previously presented) The hearing device of claim 46, wherein said grooves are spirally disposed in said wall.

52. (previously presented) The hearing device of claim 46, wherein said bone is the bone surrounding the otic capsule in a human.

53. (previously presented) The hearing device of claim 46, wherein said bone is located between the lateral and superior semicircular canals in a human.

54. (currently amended) The hearing device of Claim 45, An implantable hearing device comprising: a vibrational assembly enclosed in a hermetic housing,

wherein said hermetic housing is at least partially coated with a ~~complaint~~ compliant material; and

wherein said vibrational assembly is configured to vibrate said hermetic housing; and wherein said vibrational assembly comprises: a) at least one controllable vibrating element; and b) an inertial mass configured to vibrate in response to vibration of said controllable vibrating element.

55. (previously presented) The hearing device of claim 54, wherein said compliant material comprises silicone.

56. (previously presented) The hearing device of claim 54, wherein said compliant material comprises a silicone derivative material.